

**GOLD KING MINE TREATMENT/STABILIZATION PUNCH LIST**  
**10/31/2015 (revised)**

**Gold King Mine**

- Final Grading at dump top – ensure drainage is directed away from dump perimeter berm to prevent saturation of the berm and run-off over the face. Direct water down road and over east end of dump.
- Distribution sump and valves – excavate loose material around the inlet box and place / compact suitable material and cover valves to protect area from equipment tracking / damage
- Top of slope above adit portal: place snow poles and hazard warning to warn of steep / drop above portal. (This will be minimized by the Portal Shed planned installation. However, this may be delayed materials delivery or weather.)
- In-Mine work (Harrison Western)
  - Piping / pumping – remove rental pipe and pumps as soon as feasible following concrete work and other ground support construction activities.
  - Portal Shed – install security gate and air block in the portal shed. In the event that the portal shed is not installed in 2015, then install the security gate and air block on the first steel set outside of the portal brow.
- North Fork Cement Ck road crossing at switchback before dump
  - Install culvert per plan to ensure continuous access. This includes grading and stabilizing the area to the southeast of the creek before crossing against the steep cut-bank of the creek.
  - Use fabric and construction block (“ecology” block) to armor the inlet side of the culvert. The discharge side of the culvert must be armored to prevent erosion in the snow melt run-off periods.
  - Pond removal at switchback (completed 10/24) – remove a small volume of discolored soil/rock as appropriate on the southeast side of the channel.
- Reposition berm for mine dump at switchback (In-progress 10/24) – maintain the dump toe position along the road inside the pre-event alignment. Ensure the materials within the toe berm have adequately stabilized to provide reliable stability at the dump toe. (Cement / shotcrete and lime have been amended into this material and it needs to be examined to verify hardening is complete.)
- Flow measurement device at mine
  - Determine flow measurement method, frequency, and data transmission (EPA)
  - Install flow meter – START will be the lead and coordinate with EPA, ERRS and HW to ensure that the instrumentation and wiring are properly installed, secured and winterized.
  - Test flow meter and recording/transmission equipment (EPA/START)

- Document mine dump location relative to Bastille property (START)
  - Use the surveyor locational data and prepare a detailed map of this location including the dump position before and after the incident.
- Road grading on Gold King Road (Dump access across NFCC): Remove the berm along the road at the final phase of work to allow run-off to more evenly flow over the road side. If this is determined to not be feasible then appropriate outlets along the berm must be created with some erosion protection on the slope.

### **Gold King to Gladstone Pipeline**

- North Fork crossing at the hut
  - Streambank cleanup
- Cover valve box cluster at the Laydown area to allow easy access and add flagging stick (long enough to find location in deep snow)
- Label the specific valve ports as to the specific control function – mainline from GK, stubbed out diversion to the R n B pond, drain valves, etc. Prepare a diagram and attach a metal stamped label or equivalent inside the valve box cover. (START and ERRS shall prepare and install these by 11/6.)

### **Hut Area – Laydown Area and Roads south of the Red and Bonita Settling Pond**

- Re-grade road where disturbed from pipe/North Fork crossing work: narrow the two track road to appropriate width into laydown area.
- Regrade and prevent access to the “cut-through” between the trees at the road to the R n B dump and the Laydown area to the south. This needs to be seeded and straw covered. Prevent access obstacles are needed.
- County Road segment between R n B pond and Turn to Laydown: Remove ruts from equipment traffic and rough ground for amendments as needed and seed. In general re-establish the proper road width.
- Reclamation
  - Sample distinct segments and do paste pH to confirm which areas are overlimed, adequately limed, and not limed.
  - Loosen soil in areas outside of minimal road profile.
  - Apply lime as indicated by ABA and paste pH analysis.
  - Apply compost to disturbed areas but not to semi-circle that already has lime unless that soil has been mixed with rocky material.
  - Seed

- Add straw or erosion blankets to flat areas and erosion blanket in heavy work area by creek and sloped areas
- Crimp straw into soil using a tracked vehicle. Best done on a dry day.

### **Upper Gladstone**

- Roadside drainage ditch and berm from Pond 2 and Treatment Solids cell to the Cement creek (County Road) culvert crossing: a water-bar is needed just below the point where the two roads that join below the ponds, and the berm along the Pond 2 spill-way channel must be opened to direct road run-off into the spillway channel above the CR culvert.
- Run-on controls along east side of Gladstone Ponds – ensure that run-on is directed away from the ponds and that water drains away from the building sites.
- Spillway
  - Base at stream needs to be modified and armored (Completed 10/27)
  - Embankment along the road needs to be cleaned up – (completed 10/27)
- Reclamation Area 3
  - Confirm erosion blanket completion (may need to bury ends of erosion mat at far north end)
  - Seed and mulch flat segments near manhole. Crimp mulch.
- Depth gauge – Ponds at Gladstone (2 options)
  - Set a vertical gauge. ERRS will obtain 2-inch PVC pipe (2 ea. 10 ft. long) and START will make the post. ERRS will set standpipe in Pond 2 using ½ drum, rock, concrete as needed.
  - Set a gauge along the pond slope – this can be anchored with a weight at the bottom and at the top of bank. The gauging can be calibrated to equate to vertical elevations based on the slope angle.
- Set telephone poles at base of hillslope reclamation for runoff catchment/direction. MAP A.
- Between Gladstone ponds and sludge pond – add water bars sloped towards berm along inside of the road. (THIS IS CHANGED FROM PREVIOUS LIST)
- Clean up berm. Add check dams using rocks. MAP C.
- Rock work downstream of large culvert. MAP S
- Fencing around ponds (1, 2, and treatment solids cell) and install 2 gates to prevent road access into the upper Gladstone. Place signage on the gates – “PRIVATE PROPERTY – NO ACCESS.” (Note: do not lock the gates.)
- Lime Addition Hopper: decon and demob the lime hopper by 11/5.

## County Roads – Gladstone to Red and Bonita

- GENERAL: EPA and County road department discussed general grading needs. Details were reviewed for the segment between CR 51-turn to the NFCC crossing between SJ County (Loui) and ER (Frank) about final road details, which need to be implemented. Generally, it included roadside ditch, underdrains and culvert needs.
  - One location includes the area CR53 just south of North Fork where the underdrain was installed to support Haul-Truck traffic. Spoils from the ditch were placed across CR53 in the trees and should be removed and the muck placed back on the east side of the road – ASSUMING that is what Frank worked out with SJ County. Alternative, coarse rock and erosion control fabric is needed to fill the hole. MAP I. If the county wants the soil spoils removed from that cut can be used elsewhere that's fine. It needs to be pulled from the vegetated area along the road.
- North Fork Cement Ck Low-water crossing: re-establish the low-water crossing on NFCC, and establish appropriate drainage control at the cut-off road crossing the main Cement Creek below the NFCC Low-water crossing.
- Spur Road – pipe alignment: Restore / grade the disturbed ground along the road where piping was buried. Add vehicle access obstacles at two roads connecting CR53 near the top of hillslope area. "Reclamation in Progress" signs. Place signage far enough off CR53 so they don't get plowed away. MAP D.
- Laydown / Pull-out Area on CR10 (Across from Gladstone Command Post) MAP T: Relocate all items to be kept onsite through the winter onto the Gladstone lower area by 11/19/15. Remove all items not required at this time. (The CO DRMS steel sets and lagging need to be stored at Gladstone area for now.)
- Middle Level – Malfunction Jnct: equipment and material no longer needed, must be removed as soon as possible. Materials staged for Underground work shall remain as needed but maintain a minimal foot-print to allow county road maintenance with potential snow fall.
- Angled road to North Fork: Big berm and a big rock at the entrance to prevent vehicle traffic. Map F. A downed tree at MAP L can be used to block entrance.
- Grade and flatten. No seed. Map G. ???
- Backup areas on either side of road. Seed and mulch. Map H.
- Reclamation area 1. MAP J
  - Complete portion on east side of road.
  - Remove culvert under CR53 and install low-flow crossing.
  - Clean up NF channel, ensure adequate streambank protection/rock.

- Fix erosion blanket on west side of road. Be sure blanket covers the drainage swale.
- Confirm with county what they want to see at the CR53/CR55 junction. MAP K.
- Road from Reclamation Area 1 to Red and Bonita
  - West site of CR53 at intersection of road to Hut: Rip. Add seed and straw mulch. Crimp. MAP M.
  - Scratch, seed, erosion control blanket, deterrent for traffic on the cheater road. MAP N.
  - West side of CR53 near cheater road: rake and seed disturbed area. MAP O.
- Red and Bonita Ponds (MAP P)
  - Sludge removal. May go to sludge pond, pond at base of R&B, or into Alexco WTP.
  - Remove remaining muck from liner
  - Remove pipes, boom, liner, and other debris and set aside for disposal.
  - Remove caustic totes and other debris.
  - Remove headgates on Red and Bonita side of road.
  - Fill in ponds. Do not disturb area to north containing timbers.
  - At culvert under CR53
    - Remove boards.
    - Either remove the filter bag or leave it in place with edges covered with rocks.
    - Leave coir log
- Red and Bonita temporary repository at north base of mine dump. (MAP Q)
  - Add fabric to cover pile and fold liner over solids.
  - Cover with low pH solids staged at Gladstone to top of berm. Area = 45' x 45'.
  - Ensure drainage is adequate to avoid developing a pool.

### **Water Treatment Area**

- Plumbing for third series of filter bags (Alexco)
- **Create sample access at outfall from treatment area.**
- Relocate the Satellite dish to above ground / maybe silo or building (Alexco/EPA)
- Determine if Century Link is viable / reliable comms or not. Much of the line is exposed on the ground from below the Ski area. It is damaged in many locations between Gladstone and Silverton.

- Add pond depth meter and connect to telemetry (START/EPA and Alexco)
- Document water treatment setup (START)
- Prepare SAP/QAPP for long-term monitoring (START)
- Continue sample collection through 11/1/2015 (START)
- Continue Hach D-Cu testing to support and document system startup (START)
- Reclamation around perimeter of filter bag area (ERRS/START)
- Collect treatment solids sample for TCLP and metals analysis to help estimate characteristics of Gold King Mine water treatment solids (START) for disposal options evaluation.

### **Monitoring**

- Set up Viper system to monitor Cement Creek downstream of water treatment system discharge (EPA/START) and develop appropriate SAP for future discharge sampling and monitoring to be used for the Site.

### **Site-Wide**

- Reclamation of pull outs and over-width roads
  - Add compost as needed
  - Seed
  - Straw mulch, crimped into soil
- Document final site conditions for all disturbed areas (START) and provide as-built and materials spec information on piping, and pond systems in coordination with ERRS.
  - Inside GKM – ERRS and START to coordinate with HW and Deere and Ault with documentation for final reporting
  - Top of mine dump outside GKM
  - Pipeline path - Final piping diagram (START - Dave G. to update based on Eric A. comments)
  - Update contour map that shows piping after new North Fork crossing is installed.
  - Hut Area
  - Ponds
  - Reclamation areas
  - Roadways and road-sides

